CHAPTER II.

MANAGEMENT OF STATE FORESTS.

I.—REGULATION OF MANAGEMENT.

(*a*).—Working-Plans and their Control.

35. The following table shows the work done by Party II :—

Year.	Jungle cut and cleared.	Linear Miles surveyed.	Posts fixed.	Test trees felled.	Number of Compartments formed.	Test area enumerated.	Area for which full *data* for the preparation of plans have been collected.	Total Cost.	Cost per Acre.
	Miles.					Acres.	Acres.	Rs.	Rs. a. p.
1894-95 ...	36·591	31·708	794	29	27	1,188	15,812	20,539	1 4 9·4
1893-94 ...	68·976	71·792	828	126	36	1,550	21,106	22,979	1 1 5
Difference ...	—32·385	—40·084	—34	—97	—9	—362	—5,294	—2,440	+0 3 4·4

36. Party II, under Mr. Bell, continued the organization of the teak-bearing areas drained by the Kálánadi, Káneri and Nágzhári streams, the produce of which is transported by water to Karwar. The tract examined comprises an area of 15,812 acres, and is extremely unhealthy and mountainous, and, consequently, difficult to work in. The labour was increased by the fact that there were no maps of the forest, which had to be prepared by the Working-Plans' party.

37. Sickness was prevalent and none of the party escaped. The Extra-Assistant fell seriously ill, and had to take 2 months' leave during the working-season, and Mr. Bell, himself, was constantly down with fever.

38. Under these circumstances, it is scarcely to be wondered at that the out-turn of work shows a falling-off. Fortunately, the work to be done in the so-called Gund-group which is in the most unhealthy part of Kanara, was completed on the 15th April, and the organization of the upper slopes of the Bedti-river in the Central Division was commenced, and will be continued this season.

39. The Governments of India and Bombay have both animadverted on the cost of the organization of the teak-forests of Kanara, and appear to ascribe the comparatively-high rate of expenditure to over-elaboration. It seems, therefore, incumbent on me to explain briefly how matters stand. I am most anxious to expedite matters and to make the organization as cheap and simple as possible, but I do not think that it can be further simplified, and Government will, I trust, make allowance for the great difficulties with which all work in Kanara is beset.

40. The situation is as follows. The subject of the organization consists of a forest of trees of various species and ages from the seedling to the overmature tree three or four centuries old. The country is mountainous and very sparsely populated. The age-classes are not separated in space, trees of all ages being mixed up together.

41. The forest has, in the first place, to be divided into manageable units, or compartments, of about 600 acres, by means of narrow lanes cut through it, where no natural features are available for the purpose. This breaking-up of the area into compartments is necessary for the organization, itself, and for the carrying-out of the so-called working-plan; the rides, thus formed, are also useful for patrol-work, fire-protection, and frequently for the exploitation of produce.

42. About 7 per cent. of the trees are enumerated in diameter-classes, by means of long narrow test-plots; and the number of trees of each diameter-class of a species is deduced for the whole area from the figures thus obtained. From this result, the number of trees annually exploitable is determined with due regard to the number of trees in each diameter-class and the increment of the older classes.

43. There is surely nothing elaborate in this mode of procedure, and the heavy average cost up to date may safely be ascribed partly to the peculiar conditions already referred to; and partly to initial difficulties in the carrying-out of any undertaking of the kind, which disappear as soon as the staff has got into good working order. I feel confident that the cost this year and in years to come will be less than that of previous years.

44. The rest of the work—the location of the cuttings for the first period, the number of trees to be cut annually during the period, the regulation of grazing and other privileges, of the annual works of regeneration and improvement, &c.—is done during the rainy season from *data* collected during the field-season, and no further expense is incurred by the party in the field.

45. The following table shows the details of work done by Party No. I during the two last seasons :—

Year.	Area estimated.	Test trees felled.	Number of Compartments formed.	Area for which *data* for the preparation of Working-Plans were collected.	Number of Maps and Tracings.	Total cost incurred.	Cost per Acre.
						Rs.	Rs. a. p.
1894-95 ...	89,640·12	3,352	20	89,640·12	57	23,156	0 4 1·6
1893-94 ...	1,35,406·19	840	28	1,35,406·19	47	22,963	0 2 8
Difference ...	—45,766·07	+2,512	—8	—45,766·07	+10	+193	+0 2 6·4

46. This party was employed throughout the year in Kolábá, and completed the organization of that district.

47. The Divisional Officer, referring to the comparative slowness of the work last season, ascribes it to the greater difficulty of the country and of obtaining daily labour, which had to be procured by the month, and lastly, to sickness of the members of the permanent establishment who all suffered from fever.

48. The character of the forest examined was similar to that organised during the previous season, and for which a plan of working was submitted for the sanction of Government with my No. 5309, dated 13th December, 1894. The work last season was carried out on the same lines, and the proposed plan of working the forests has been submitted by the Divisional Officer and will shortly be in the hands of Government.

49. The cost of the preparation of plans for Kolábá has amounted to Rs. 46,119, and that for Kanara to Rs. 1,56,707 up to date.

50. The total area for which complete *data* were collected, comprised 413,856 acres, and the average cost per acre came to 7 annas and 10 pies. Complete working-plans have been submitted for 364,257 acres of this area.

II.—WORKING OF THE YEAR.

(*a*).—Communications and Buildings.

51. Form No. 51, appended, shows details of works executed during the year under report.

52. "Roads and bridges" cost Rs. 1,845, and buildings, &c., Rs. 4,754.

53. In the Northern Division of Kanara, a sum of Rs. 304 was expended on making new cart-tracks, and Rs. 130 on repairing old tracks. 4 watch-houses and 3 wells were newly built for Rs. 2,150, and Rs. 294 were expended in repairing existing buildings.

54. In the Central Division of Kanara, Rs. 631 were laid out on road-repairs, and Rs. 745 on repairs, &c., to Forest-buildings.

55. In the Southern Division of Kanara, repairs to buildings cost Rs. 482, and, in Belgaum Rs. 132. The Halshi-Nágargáli forest-road was repaired at a cost of Rs. 543.

56. The Dharwar and Kolábá depôt-and guard-houses were repaired for Rs. 180.

(*b*).—Protection of Forests from Injury.

(*1*).—*General Protection and Breaches of Forest Law.*

57. The following table shows the number of prosecutions and breaches of forest rules during the years 1893-94 and 1894-95 :—

Division.	Cases of the year 1893-94.							Cases of the year 1894-95.							Percentage of failures.	
	Pending in Court on 1st July 1893.	Taken into Court during the year.	Total.	Disposed of by Magistrates during the year. Convictions.	Acquittals.	Total.	Pending in Court on 30th June 1894.	Pending in Court on 1st July 1894.	Taken into Court during the year.	Total.	Disposed of by Magistrates during the year. Convictions.	Acquittals.	Total.	Pending in Court on 30th June 1895.	1893-94.	1894-95.
Northern Division, Kanara ...	3	102	105	32	73	105	...	...	55	55	19	17	36	19	69	47·9
Central Division, Kanara... ...	...	25	25	15	6	21	4	4	12	16	10	6	16	...	24	37
Southern Division, Kanara ...	...	36	36	31	3	34	2	2	12	14	8	5	13	1	8	38·5
Belgaum Division	6	26	32	26	5	31	1	1	31	32	21	8	29	3	15	27
Dharwar do.	2	17	19	12	5	17	2	2	14	16	8	8	16	...	26	50
Bijápur do.	...	10	10	10	...	10	...	...	22	22	21	1	22	...	...	4·5
Kolábá do.	4	287	291	187	33	220	71	71	207	278	238	25	263	15	11	9·5
Ratnagiri do.	1	62	63	43	18	61	2	2	11	13	10	2	12	1	28	16·6
Total ...	16	565	581	356	143	499	82	82	364	446	335	72	407	39	24·	17·7

Northern Division of Kánara.

58. The decrease (47) in the number of magisterial cases for 1894-95, was due to the fact that in 1893-94 an unusually large number of people had to be prosecuted for theft near the town of Karwar, and these prosecutions had a beneficial effect.

59. Of the 55 cases taken into Court, 22 were for illegal *kumri*-cultivation (18 in Súpá and 4 in Karwar).

60. In the Central Division of Kanara, the percentage was 37 against 24 of 1893-94, but the number of prosecutions decreased from 25 in 1893-94, to 12 in 1894-95. The Divisional Forest-Officer gives no explanation for the decrease. He remarks that the number of cases is so small that the percentage of failures, as compared with other years, is not a fair criterion of the degree of care exercised in bringing cases before the Courts.

61. The decrease in the number of cases is doubtless due to the leniency enjoined by Government in their Resolution No. 7907 dated 6th October, 1892. The total number of cases of all kinds has decreased in the Central Division, from 31 in 1893-94, to 25 in 1894-95, and a relatively greater number has been compounded. The Collector remarks, in regard to the offences in this division, that "the very small number of such cases shows with what leniency and consideration the forest-officers enforce the Act, though, no doubt, if there were larger establishments able to do more patrolling, a much larger number of petty offences would be discovered, and some of these it would certainly be desirable to have punished."

62. In the Southern Division of Kanara, the number also decreased from 36 to 12. Ten of these cases occurred in Siddápúr, and out of the nine disposed of in that range, conviction was obtained in four, all of which were for the illicit cutting of timber. In the five cases in which conviction failed, three were for cutting *soppu* of the reserved kinds of trees and they were let off on the ground that they were trivial offences. Two were let off for want of sufficient evidence.

63. The percentage of failures was 38 against 8 in 1893-94.

64. The decrease in the number of cases is partly balanced by the increase in the number of compoundings (14). The decrease in the number of cases may be attributed to the desire on the part of the Divisional Officer to carry out the lenient policy of Government.

65. In Belgaum, the number of cases increased from 26 to 31, and the percentage of failure from 15 to 27. The failures were mostly in Khánápúr, where, of 9 cases, 5 were dismissed. In most cases of failure the result is reported to be due to the dishonesty of witnesses who stated one thing before the Range-Officer, but quite the opposite before Magistrates. Of the 31 cases taken before Magistrates, 27 were for misappropriation of timber and minor produce, 2 for illicit grazing, and 2 for illegal cultivation in forests.

66. In Dharwar, there were 14 cases against 17 in 1893-94, and 2 were pending trial at the commencement of the year. Of the 16 cases disposed of by Magistrates, only 8 were successful, the percentage of failures being 50, against 26 in the previous year. The Divisional Officer is unable to explain the cause of this increased percentage.

67. In Bijápúr, the number of cases rose from 10 to 22, and nearly all were for theft of wood. Only in one case were the offenders acquitted, a fact which tends to show that the Divisional Officer exercised good judgment in selecting cases for trial. The cause of the increase in the number is not apparent.

68. In Kolábá, the number fell from 287 to 207, and failures were also slightly less. The decrease in the number of cases was partly owing to the circumstance that an unusually large number of cases (126) of illicit *dalhi* cultivation was taken into Court in 1893-94, but the Divisional Officer attributes it, to a less extent, to slackness of the establishment. Of the 263 cases disposed of, only 25 were unsuccessful.

69. Of the 13 cases—11 of the year under report and 2 of the preceding one—disposed of by Magistrates in Ratnagiri, 2 were dismissed. Of these two, one related to the theft of wood in *khóti*-land. All, except one of these cases, were of small importance, and were settled by fines. The remaining one, in which the *khóts* of Bándh-Tivre were accused of having obstructed the forest-officers in the cutting of trees in *dhárá*-land, was dismissed on the ground that the cutting of trees did not form part of the lawful authority of forest-officers.

70. Details of cases of misappropriation of timber and other minor produce, as required by Government Resolution No. 7232 dated 12th September, 1892, are given in Appendix 52 A.

71. Appendix 52 B shows details of cases compounded under section 67 of the Forest-Act, during the year under report.

72. The following gives the cases dealt with under the section in each division for 1893-94 and 1894-95:—

Division.	1893-94.				1894-95.			
	Total number of cases disposed of.	Number of cases commuted.	Number of cases discharged.	Amount of compensation recovered.	Total number of cases disposed of.	Number of cases commuted.	Number of cases discharged.	Amount of compensation recovered.
				Rs.				Rs.
Northern Division, Kanara ...	33	33	...	409	98	98	...	504
Central do. ...	7	6	1	17	13	13	...	32
Southern do. ...	1	1	...	9	15	15	...	61
Belgaum Division	86	84	2	36	115	115	...	147
Dharwar do.	35	5	30	1	11	11	...	12
Bijápúr do.	12	12	...	15	22	22	...	20
Kolábá do.	181	181	...	618	122	122	...	788
Ratnagiri do.	39	39	...	71	20	20	...	7
Total ...	394	361	33	1,176	416	416	...	1,571

73. The increase (55) in the number of cases compounded, occurs mostly in Northern and Southern Kanara and Belgaum. In the Súpá sub-division (Northern Kanara), the number rose from 4 to 64, and the increase was due to the sudden outbreak of *Kumri* referred to in paragraph 59. In Southern Kanara, cases of illicit cutting of *Soppu* were compounded during the year while in the preceding year they were disposed of by the sale or destruction of the produce.

74. In Belgaum, where the number rose from 84 to 115, a large number of offences of timber-cutting was compounded.

75. In Kolábá, the number fell from 181 to 122, and this fall is due to the occurrence of fewer cases of unauthorized cultivation by wild tribes. The amount of compensation recovered was, however, larger by Rs. 170. In three of the cases sums over Rs. 50 were levied. In these cases there were no less than 51 offenders who were fined Rs. 264.

76. Appendix 52 shows the number of cases compounded and taken into Court, during the year under report. The following table gives the figures for the past two years:—

Division.	Taken into Court.		Compounded under Section 67.		Total number of cases.	
	1893-94.	1894-95.	1893-94.	1894-95.	1893-94.	1894-95.
Northern Division, Kanara ...	102	55	33	98	135	153
Central do. ...	25	12	6	13	31	25
Southern do. ...	36	12	1	15	37	27
Belgaum Division	26	31	84	115	110	146
Dharwar do.	17	14	5	11	22	25
Bijápúr do.	10	22	12	22	22	44
Kolábá do.	287	207	181	122	468	329
Ratnagiri do.	62	11	39	20	101	31
Total ...	565	364	361	416	926	780

77. The total number of offences detected in the Circle, decreased by 146, while the number compounded, increased by 55, facts which appear to indicate that on the whole greater leniency was displayed towards offenders. I must say that Divisional Officers, who report particulars of all cases to me, appear to me to have exercised their powers under section 67 of the Forest Act with great consideration, and I have certainly been unable to detect any tendency to harshness in their dealings under that section. All Collectors, too, with one exception, who have referred to the subject in their forwarding memoranda, consider that Divisional Officers have worked this section with care and judgment.

78. The Collector of Bijápúr alone offers a qualified dissent from this opinion. In Bijápúr, the number of compoundings rose from 12 to 22, and the Collector is of opinion that "there appears ground for apprehension that the orders of Government regarding the application of the section have not been strictly followed. In three of the cases, the amount of compensation recovered was only 2 annas each; and in all these cases the amount of compensation was equal to the estimated value of the damage to the forests. In future, however, the proceedings under that section will be subjected to closer supervision in accordance with the orders issued in Government Resolution No. 4516, dated 18th June, 1895."

79. The sums levied naturally seem paltry to a new-comer. But, in forestry, the word "valuable" is a very relative term, and depends on circumstances. In Bijápúr, if a few miserable sticks, used in the construction of the slenderest fabrics be excepted, the forest consists of scrub fit for nothing but firewood. The produce (with the exception of *cassia*, the bark of which is used in tanning) is removed by head-loads or animal-loads for sale as firewood in the bazárs, and a head-load of such stuff is worth only a few annas. If, therefore, no notice is taken of the theft of a head-load of this description, no notice can be taken of the theft of, practically, the whole forest. A man, who is caught perhaps in one act of fifty, is warned and let off. When the same individual is again caught in the commission of an offence, it is compounded by the payment of the value of the wood as estimated by a *panch*, whose sympathies are entirely on the side of the thief, who then goes off to the nearest bazár and sells his load for its real value. In my opinion, these cases in Bijápúr have been extremely leniently dealt with, in fact too leniently. To accept only the value of the wood as estimated by an indulgent *panch*, is really to offer a premium on theft, in a district, moreover, which is extremely badly off for wood, and in which the protection of the remnants of the forest is of very great importance to agriculturists as well as to the inhabitants, generally.

80. A large number of cases was let off with simple warning. There were 101 such cases in Kolábá, and altogether 363 have been reported.

(2).—*Protection from Fire.*

81. The following table shows the results reported for each Division:—

Division.	Area in Square Miles.			Percentage of failures to area attempted.	Cost.		Proportion of area under fire-protection to total area of Reserves.
	Attempted.	Failures.	Protected.		Per square mile protected.	Per acre protected.	
					Rs.	Pies.	
Northern Division of Kanara	567·05	5·23	561·82	·92	21·87	6·5	...
Central Division of Kanara	275·43	37·79	237·64	13·72	24·07	7·2	...
Southern Division of Kanara	...	...	...	...	...	...	...
Belgaum Division ...	308·43	8·85	299·58	2·8	10	3	...
Dharwar do. ...	56·22	8·23	47·99	14·16	12·12	3·6	...
Bijápúr do. ...	104·32	5·28	99·04	5·06	4·6	1·4	...
Kolábá do. ...	100·57	1·64	98·93	·01	6·7	2·01	...
Ratnagiri do. ...	20·08	·00	20·08	·00	0·81	·25	...
Total in 1894-95 ...	1,432·10	67·02	1,365·08	4·68	16·69	5·00	50·77
Total in 1893-94 ...	1,320·	26·	1,294·	1·97	15·62	4·68	53·41
Increase or Decrease in 1894-95	+112	+41	+71	+2·71	+1·07	+0·32	—2·64

82. A larger area was firetraced in every division excepting Bijápúr. The cost per square mile increased from Rs. 15·62 to Rs. 16·69 owing to the long drought. The failures reported also increased 2·71 per cent.

83. The comparative failure of the operations is partly ascribed to incendiarism and partly to the long drought, which increased the danger of accidental fire. It is quite impossible to say positively, in any case, to which of the two causes a fire should be ascribed, unless, indeed, an incendiary has been detected in the very act—an extremely rare occurrence. Where, however, the same jungles

are burnt year after year, as in parts of Mundgod, there is strong presumptive evidence that the fires have been wilfully lighted.

84. The apparent decrease in the proportion of area protected from fire to the total area, is owing to about 305 square miles of "Protected" forest having been converted into "Reserved" during the year under report.

85. In the Northern Division of Kanara, of the 567·05 square miles attempted to be protected, only 5·23 square miles were reported as having been burnt, the area burnt in the previous year being ·38 of the 513·61 square miles fire-traced. Thirty-two fires occurred in the division. Of these, 28 are reported to have been purposely lighted by villagers for grazing purposes.

86. In the Halyál-range, 49 square miles of forest were added to the specially protected area, during the year.

87. The area under protection in Central Kanara, was increased by 13·54 square miles. The cost per square mile was Rs. 24·07, against Rs. 22·92 of 1893-94.

88. No special measures were adopted in Southern Kanara, and the greater part of the Siddápúr and Sirsi ranges was no doubt burnt.

89. The area attempted in Belgaum amounted to 308·43 square miles, against 278·88 square miles in 1893-94. The percentage of failure to area protected, was 2·8, against 2·49. There was a little increase in the expenditure, which came to Rs. 10 per square mile, as against 9·04 of the previous year. The increase was necessitated by the extension of fuel-cuttings in Khánápúr, the protection of which costs more than that of the ordinary forests. The fire-protection had also to be prolonged owing to absence of storms in April and May.

90. One hundred and five cases of fire are reported to have occurred in the protected area, and nearly all of them were, Mr. Murray says, "undoubtedly caused by incendiaries intent on getting an early supply of grass for their cattle or of ashes for their fields."

91. The area attempted in Dharwar, showed a small increase (2·31 square miles), and the results reported compare favourably with those of the previous year. There were 63 reported fires in the division.

92. In Kolábá, about one-quarter of the area of the division was under protection, and 98·93 square miles are reported to have been successfully protected out of 100·57 square miles attempted. The cost, however, is about double that of the previous year, and this is because the number of fire-traces was increased during the year under report.

93. The following areas are estimated to have escaped fire without the adoption of special measures :—

	Acres.
Northern Division of Kanara	471,531
Central Division of Kanara	385,142
Southern Division of Kanara	919,530
Belgaum Division	230,327
Dharwar Division	218,921
Bijápúr Division	88,960
Kolábá Division	131,443
Ratnagiri Division	...
Total ...	2,445,854

94. The area reported as having escaped fire without the taking of special measures amounted to 4,162 square miles, or 77·3 per cent. of the whole area, during 1893-94. During the year under report, it amounted to 3,822 square miles, or 71·8 per cent. of the whole area. I am afraid that but little reliance can be placed on these figures. Those for Sirsi and Siddápúr, for instance, are, I should say from what I saw, extremely inaccurate. In these two ranges 1,111 acres, of a total area of 531,075 acres, are reported to have been burnt, and the damage is said to have been Rs. 21. In my opinion, a far greater area than that reported was burnt, and it is quite certain that the extent of the fires has been greatly under-estimated in both ranges.

95. Altogether there were 649 cases of detected fires, but the offenders were discovered in only 12.

(3.)—Regulation of Grazing and Protection from Cattle.

96. The area closed to all animals amounts to 852 square miles, to browsers 845, and that open to all animals to 3,648 square miles. Details of the areas closed and left open respectively, are given in Appendix 54.

97. The area closed to browsers during the year, shows an increase of 114 square miles. In the reserved forests of Gókák in Belgaum, the grazing of goats and sheep was prohibited. The total area closed to all animals, in the Circle, is the same as the previous year's, but there is an increase of 1, 4 and 24 square miles in Southern Kanara, Belgaum and Kolábá, respectively. Twenty-seven square miles of the area closed during the "whole year" in 1893-94, were only closed for a "part of the year" in 1894-95.

98. The number of cattle impounded during the year under report and the year before, in open and closed forests, is given below:—

Division.	Number of Animals impounded during 1893-94.			Number of Animals impounded during 1894-95.		
	In open Forests.	In closed Forests.	Total.	In open Forests.	In closed Forests.	Total.
Northern Division of Kanara ...	111	157	268	3	312	315
Central Division do. ...	37	71	108	...	269	269
Southern Division do. ...	8	62	70	...	17	17
Belgaum Division	3,527	2,019	5,546	1,783	3,523	5,306
Dharwar do.	2,253	981	3,234	2,752	3,501	6,253
Bijapúr do.	2,270	1,299	3,569	2,846	1,087	3,933
Kolábá do.	...	573	573	244	1,801	2,045
Ratnagiri do.	...	224	224	26	268	294
Total ...	8,206	5,386	13,592	7,654	10,778	18,432

99. The increase in the number impounded in Dharwar is ascribed by the Divisional Officer to greater vigilance on the part of the forest-subordinates.

100. There is a relatively large increase in the Central Division, but the number of cattle impounded was still very small for so large an area.

101. In Kolábá, the large increase is mainly due to trespass of cattle on closed areas. Those which were impounded in open forests belonged to persons who declined to pay the fee.

102. The comparatively small increase or decrease in other divisions appears to call for no remark.

(*c*).—Improvement of Forest Growth.

(*1*).—*Natural Reproduction.*

(*1*).—*By Seed.*

103. Owing to the increased prevalence of fires and the long drought the season was a most unfavourable one for natural reproduction by seed.

104. During my tour in the Gokák-forests of the Belguam Division, I was pleased to see that there had been at least no deterioration since I last visited them some years ago, the general impression left on my mind being that the better parts had, if anything, improved.

105. In the Bijápúr Division, which is the driest in the Circle, I was struck with the excellent natural growth, from seed of *Dodonœa viscosa* and *Chloroxylon swietenia* in places in which sand had collected in the interstices of rock, or in the hollows. But, at the same time, it was very apparent that cattle had trespassed greatly on the closed portions of the reserves, and it seems to be necessary in this, as well as in other dry districts, to resort to the fencing of closed areas. If, therefore, barbed wire-fences, which are about to be tried in the more valuable forests, prove a success, it may perhaps be worth while to introduce them in the scrub-jungles of Bijápúr, Dharwar and Belgaum, in none of which illicit grazing can, it seems, be suppressed by ordinary means.

106. Curiously enough, some of the best natural reproduction by seed is to be found in the young coppice-forests from which fuel for the West Deccan Railway is procured. In them, vigorous young seedlings of the better kinds may be seen flourishing even under dense coppice. Numerous seedlings of the following species were noticed:—*Careya arborea*, *Xylia dolabriformis* (now

reckoned a much better material for sleepers than teak), *Terminalia tomentosa*, *T. paniculata* (both excellent timber species), *T. chebula* (a good timber-tree, besides yielding the myrobollam of commerce). This seedling-growth is a very satisfactory feature in the regeneration of these fuel-forests. It should ensure their permanence and improvement, and may perhaps be ascribed to fairly-good protection from cattle-trespass. At present the sustained yield of the area, referred to, is about 50,000 tons of 68 cubic feet each, but when it is fully stocked, the yield will be very much greater.

(2).—By Coppice.

107. There is nothing to add, under this head, to what has been written in former reports. Coppice-growth is satisfactory except in comparatively few cases in which the soil, or the stools, have become exhausted.

(2).—Artificial Regeneration.

108. The dibbling-in of seeds of the better kinds of tree and the planting, out of seedlings under a certain amount of shade, appear to be the best and cheapest modes of artificially regenerating and improving the jardinaged forests of Kanara. Regular plantations there, or in the poorer jungles of the Circle are rarely completely successful and always very expensive, and the attention of the Department is, therefore, directed to periodical closures in the first place, and, secondly, to the supplementing of natural growth by the dibbling-in of seeds, and by the planting of superior species under cover of the advance-growth. In the more populous parts of the Circle, the difficulty of complete closure is one of the principal obstacles to be overcome, and, with a view to make it more effective, it is proposed, as already observed, to resort to barbed wire-fences, and a quantity has been budgetted for in the estimates for 1896-97.

109. Experiments made above and below the ghâts show that planted seedlings of teak and other valuable species are quite able to establish themselves without aid if provided with a moderate amount of shade. Ample evidence of the truth of this assertion exists, for example, in the forests of Katgal below the ghâts, and in those of Birchi above the ghâts; but teak-seedlings planted out in regular plantations, in the open, require to be watered for one or two seasons, and even then do not seem to thrive. These considerations have led to regular plantations being looked upon with disfavour.

Northern Division of Kanara.

110. *In the Halyál-range,* 6,500 teak-seedlings were planted in the forests in bamboo-tubes.

111. *In the Súpá-range,* 3,300 were put out, and, of those planted last season, 1,500 are reported to be flourishing.

112. In the Karwar-range, 1,700 teak-seedlings were put down. Of the previous season's crop, 1,200 teak and 900 *hardas* are reported to be doing well.

Central Division of Kanara.

113. *Yellápúr-range.*—A regular plantation in the Wantmane-jungle proved a failure and was abandoned.

114. The number of young plants put out in plantations was 3,955.

115. The number of young plants surviving in *plantations* was 13,927, against 13,659 in 1893-94.

116. *Ankola-range.*—3,950 seedlings were put out in plantations, and the number of young plants surviving in plantations, was 27,825, against 26,472 in 1893-94.

117. *Mundgod-range.*—4,174 teak-seedlings were put down in the Hulihond-plantation. At the end of the year, 5,114 young plants survived in the plantation. Much damage was done by a fire that swept over this plantation, but it is hoped that the burnt seedlings will shoot up, as some have already sprouted again.

118. Besides the above additions to regular plantations, 16,714 plants were planted in suitable places in the forests of the Central Division; and seeds were dibbled in on 44,386 patches and 33 bag-fuls were sown broadcast.

Southern Division of Kanara.

119. 1,100 plants were put down, from a nursery, in the forest of Katgal, and were looking well at the end of the season.

Belgaum Division.

120. 956 plants of blackwood, *hone* (Pterocarpus marsupium) and *matti* (Terminalia tomentosa) were put down in the fenced portion of the Hemadge-forest, and, of these, 715 survive.

121. 108 seeds of *Swietenia macrophylla*, received from Mr. Gleadow, were sown: 50 have germinated.

Kolábá: Ratnágiri. 122. 7,302 plants, chiefly casuarina, were put down from nurseries in the Dápóli plantation, and 9 *khandis* of seed were sown broadcast in the forest.

Bijápúr. 123. 37 maunds of *ním*-seed, 12 of *Chloroxylon swietenia* and 6 seers of sandal were collected and sown.

(3).—Early Thinnings.

124. 123 acres of the Karwar casuarina-plantation were thinned.

125. 172 square miles of forest in the Halyál-range were thinned, and 25 square miles in Súpá.

126. 648 acres in the Hunshettikóp-jungle of the Yellápúr-range were thinned.

127. 4,000 acres of forest were thinned in the Khánápúr-range of the Belgaum Division.

(4).—Other Operations for the Improvement of the Forest.

128. In Kolábá, inferior species on 4,200 acres were girdled to death.

129. Similar operations were carried out in Belgaum (4,000 acres): in the Yellápúr-range (200 acres): in Súpá-range (1,200 acres): in Karwar-range (1,000 acres).

130. Forest guards were also employed in cutting down creepers and other vegetation that interfered with the growth of superior species.

(5).—Experiments.

131. A small quantity of seed of *Swietenia macrophylla* was sown in the Yellápúr-range, and 94 seedlings were raised and transplanted, but died in the course of the year.

132. In the Belgaum-range, 50 seedlings of this species were grown.

CHAPTER III.

GROSS YIELD AND OUTTURN OF FOREST PRODUCE.

NORTHERN, CENTRAL AND SOUTHERN DIVISIONS OF KANARA.

133. The large teak exploited, yielded 404,129 cubic feet against 371,216 cubic feet in 1893-94; and small teak, such as poles, rafters, &c., aggregated 58,610 cubic feet against 28,018 cubic feet.

134. The large jungle-wood removed, fell, from 336,605 cubic feet in 1893-94, to 322,265 cubic feet in 1894-95, and small jungle-wood, from 20,298, to 11,393 cubic feet. The quantity of large black-wood exploited also fell, from 30,205, to 18,055 cubic feet.

135. The increase in the yield of large teak, occurs chiefly in the Northern Division of Kanara, where contractors brought in wood (about 70,000 cubic feet) which was due in the previous year. On the other hand, the Central Division of Kanara shows a decrease of about 39,000 cubic feet, because wood for the Kódibág-depôt arrived too late to be accounted for in 1894-95.

136. There was a good demand for teak-poles, and, therefore, the clearing-off of teak in occupied lands was accelerated.

137. In 1893-94 the demand for *matti* (Terminalia tomentosa) and black-wood was abnormally great, and to this circumstance is due the decrease in the quantity of jungle-and black-wood exploited during 1894-95.

138. The demand for bamboos continued to be good, the number of stems extracted rising, from 3,707,493, to 4,386,358.

139. The crop of myrobollams was very poor, the quantity collected being 2,312 khandis against 4,479 in 1893-94.

140. The firewood exploited, increased, from 1,211,623 cubic feet, to 3,142,352. The increase is common to all three divisions of Kánara, but occurs chiefly in Northern and Southern Kanara; about 356,000 cubic feet more than the quantity removed in 1893-94 were